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# CITATION ANALYSIS OF DOCTORAL THESES REFERENCES AS A TOOL FOR COLLECTION MANAGEMENT IN HISTORY: A STUDY OF PANJAB UNIVERSITY, CHANDIGARH (INDIA)

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# **CITATION ANALYSIS OF DOCTORAL THESES REFERENCES AS A TOOL FOR COLLECTION MANAGEMENT IN HISTORY: A STUDY OF PANJAB UNIVERSITY, CHANDIGARH (India)**

## **Abstract**

A citation analysis study was carried out on the citations appended in the end of History discipline Ph.D. dissertations to ascertain what types of documents are the most frequently used in the research process, the most commonly consulted core journals and obsolescence rate of the journals and books. The study analysed **8488** citations appended in the 36 Ph.D. theses of History discipline submitted to Panjab University, Chandigarh, for the award of doctoral degree during 2002-2012. The results obtained from the 8488 citations revealed that the most frequently used documents were books, which accounted for 54.16 percent of the total citations and ‘Economic & Political Weekly’ was found to be the most cited journal. Bradford’s law of scattering was used to identify the core journals in the field of History. The result of the study may be used as a tool for the collection management for central Library of Panjab University, Chandigarh.

**Keywords:** Citation Analysis; Authorship Pattern; core journals; Bibliographic Form; Ph.D. Theses; Panjab University; History.

## **Introduction**

Citation analysis is the part of the scholarly publication (Martin, 1976). According to Encyclopedia of Library and Information Science (1974), “Citation analysis makes use of bibliometric references, which are an essential part of scientific communication”. Nicholas & Ritchie (1978) in their study “Literature and Bibliometrics” explained the significance of citation analysis and its applications in LIS. They pointed out that “information scientists and librarians use citation analysis to quantitatively evaluate the core journal titles and watershed publications (less used or border lined publications) in particular disciplines; interrelationships between

authors from different institutions and schools of thought; and related data about the academia. Some more pragmatic applications of this information include the planning of retrospective bibliographies, finding the age of material used in a discipline (Half life), and correlation between utilization of current publications versus older ones, comparing the coverage of secondary services which can offer publishers some assistance to gauge their accomplishments and competition, and can help librarians in evaluating the worthiness their stock". Citation analysis, thus, is that area of bibliometrics which deals with the study of the relationship between a part or whole of the cited document and a part or the whole of the citing document.

### **Overview of Panjab University, Chandigarh**

Panjab University currently has 78 teaching and research departments under the Faculties of Arts, Science, Languages, Law, Education and Fine Arts, Business Management and Commerce, Engineering and Technology, Medical Sciences, Pharmaceutical Sciences as well as Dairying, Animal Husbandry and Agriculture. It has 188 affiliated/constituent colleges spread over Punjab and Chandigarh. It also has four regional centers at Muktsar, Ludhiana, Hoshiarpur and Kauni along with Vishveshwaranand Vishva Bandhu Institute of Sanskrit and Indological Studies (VVBIS&IS) at Hoshiarpur. It has more than 700 faculty positions, more than 10, 000 students and 1000 research scholars. It is the hub of education and research and confers a large number of doctoral degrees every year in different fields.

### **Department of History**

As per Handbook of Information (2015), the Department of History was established in 1951. Currently, the department has eight full time faculty members. It offers M.A., M. Phil. and Ph.D. courses. The research opportunities are available in ancient, medieval as well as modern history. The thrust areas of the department include the study of the broad North- Western Region in terms of polity, economy, society and culture since the earliest time in the PAN Indian integrated and interdisciplinary perspective. More than 170 research scholars have already been awarded the doctoral degree since the inception of the department and 30 research scholars are currently pursuing their research work for the award of doctoral degree.

### **University Library**

The Panjab University library is officially named as A.C. Joshi Library. It is housed in a five storey centrally air-conditioned building in red stone. The library has a seating capacity of 650 readers. It is fully computerized with an integrated system connected to the campus network. It provides various facilities like photocopying, Internet, Online Public Access Catalogue (OPAC), multimedia, CD databases and online journals and books. Total budget of books, journals, magazines, newspaper, software licenses, etc. was Rs. 29425000 in 2014-2015. The library houses nearly 7.3 lakh volumes, which include bound volume of journals, books, theses/dissertations, rare books, reports, government reports, Manuscripts and CD- ROMs. It is subscribing to more than 650 periodicals in addition to about 5000+ on line journals accessible through UGC's INFONET consortia. The library is also a member of Developing Library Network (DELNET) and Information Library Network (INFLIBNET) and provides resource sharing facility to the users. The library is facilitating the computer access facility for the visually impaired students and Wi-Fi facility to access online resources on the laptops. It has installed RFID technology to facilitate efficient auto issue/return of books, better inventory control and improved security system for books in the library. Presently, the library is in the process of digitizing theses/dissertation and manuscripts in its collection (<http://www.library.puchd.ac.in>).

## **Review of Literature**

**Nasir, Umar, and Khan (2010)** in their paper entitled 'A Citation analysis of doctoral dissertations submitted in the Department of History, Aligarh Muslim University, Aligarh' analyzed 4500 citations from 41 Ph.D. theses submitted during 1990-2010. The findings of their study reveal that books had the highest number of citations, accounting for 72.5% of the total citations. Majority of the documents were in English language (45.52%), followed by Persian language (32.46%), and Urdu language (13.6%). It was found that 77.41% of the articles were produced by single authors. The 'Journal of Bihar Research Society' occupied the first rank with highest citations (6.44%). **Sengar (2014)** in his paper entitled 'Authorship pattern, degree of collaboration and research publication trend among scientists/researchers of CSIR-IMTECH, India 1991-2010: a bibliometric study' examined 902 research papers to find out the collaborative strength and pattern of authorship amongst the CSIR-IMTECH scientists/researchers, covering a period of 1991-2010. The results of his study revealed that majority of the scientists/researchers prefer to publish research papers in joint authorship. The

degree of collaborative authorship was found to be 0.83. More productivity of research articles was found in 2007 and 2010. They also noted that the trend of multi-authorship and collaborative studies was increasing gradually in the CSIR-IMTECH research. **Tunga (2014)** in his paper entitled 'Authorship pattern and degree of collaboration in journal articles: a citation study of doctoral dissertations 1991-2010' analyzed 8437 journal articles and 1327 books appended in 80 doctoral dissertations submitted to Bidhan Chandra Krishi Viswavidyalaya and Uttar Banga Krishi Viswavidyalaya (West Bengal) during 1991-2010. He indicated that horticulture scientists mainly used journal articles (77.96%). Majority of the authorship pattern was found to multi-authored (78.99%), followed by single authored papers (20.69%). The highest number of citations was cited in 2005. The degree of collaboration in Horticulture was found to be 0.79. **Veerabasavaiah and Padmavathi (2014)** in their study entitled 'Citation analysis of doctoral theses in Education submitted at the Bangalore University, Bangalore, during 2003-2012' carried out an analysis of 6688 citations from 42 doctoral theses. They observed that the highest number of theses (12, 28.57%) was submitted during 2009, followed by 11 theses (26.19%) in 2010 and 5 theses (11.91%) in 2004. Their study revealed that journals were the most preferred sources of information used by the researchers in the field of Education, accounting for 39.43% citations, followed by theses/dissertations (37.93%), reports (9.20%) and websites (5.05%). The single authorship was most preferred (54.04%), followed by two authors (27.08%). Their study revealed that most of the cited journals were published from U.S.A., followed by India and UK. Most cited journal was the 'Journal of the Applied Psychology' (5.20%), followed by 'Indian Education Review' (3.68%), 'Journal of Educational Research' (2.85%) and 'Child Development' (2.81%).

### **Significance of the Study**

University libraries in order to serve their clients must understand their needs first so that the information sources are acquired accordingly. It is more important in the current scenario of information overload (where information is available in different formats), shrinking budgets and rising cost of the scholarly literature. The emergence of new disciplines due to interdisciplinary research and fission and fusion of subjects has further compounded the problem of acquiring the relevant literature. As a result, the collection in the library has to be developed carefully keeping in view its perspective users. One of the methods to assess the usage of the material acquired in

the library is the citation analysis which helps in evaluating the types and the quality of sources used by the researchers. It provides a blueprint to the librarians to make informed decisions about the collection policy as it indicates the use of the resources and their maintenance or ultimate disposal in the library collection. It informs the librarians as to which type of documents should get a higher priority for selection and acquisition on the basis of the cited documents in theses and dissertations. It also enables the librarians to continuously provide scholars with access to the core journals and books in their fields. Hence, such type of citation analysis is of great potential to the librarians in managing their library collections.

### **Objectives of the study**

1. To observe the nature of authorship pattern in the field of History.
2. To examine the half-life of books and journals in the field of History.
3. To observe the chronological distribution of citations in the field of History.
4. To determine the national and international coverage of citations in the field of History.
5. To study the distribution of citations of different information sources and their formats.
6. To determine the ranking of most cited journals in Ph.D. theses in the field of History.
7. To assess the availability of the highly cited journals in the field of History at Panjab University.

### **Research questions**

The present study sought answers to the following questions:

1. What is the trend of authorship pattern in the field of History?
2. What is the half-life of literature used in the field of History?
3. What is the average age of cited material in the Ph.D. theses submitted in the field of History at Panjab University?
4. Which are the top cited journals in field of History at Panjab University?
5. Which type of reading material is preferred by the History research scholars at Panjab University?

6. What are the most cited items in the Ph.D. theses submitted in the department of History at Panjab University?
7. What is the average number of citations per thesis submitted in the field of History at Panjab University?

### **Research methodology**

Keeping in view the objectives of the study, various research methods were explored. For the present study, data was collected from 36 Ph.D. theses submitted during 2002-2012 in History departments at Panjab University (Chandigarh). The first step of this study was to select the theses (i.e., the source document) from which the data was collected. Citation/Bibliography of each thesis was recorded manually on a standardized card and then empirically analyzed. MS-Excel was also used wherever appropriate to store and analyse the data. The collected data was tabulated in terms of ranked list of journals, authorship pattern of books and journals, chronological pattern of cited sources, geographical pattern of cited sources, etc. The data was analysed by applying appropriate techniques and bibliometric laws. The simple counting citation technique and Bradford's Law was applied to determine the core journals in the field of History. Further, half-life period of books and journal citations were also calculated.

### **Data collection technique and instruments**

The basic purpose of the present study was to find out the various characteristics of the literature used by the research scholars at Panjab University, Chandigarh in the discipline of History. Simple citation count method was considered to be the most appropriate technique for the study as it involves counting of citations on the basis of their characteristics like subject, authorship pattern, chronological distributions and geographical distribution, etc. The methodology chosen for this study is based on the critical examination of citations in the references cited at the end of the Ph.D. theses. The citation data were studied to find out the core journals and to rank them. The bibliographical references cited at the end of the doctoral theses were taken as the source data for the present research work, for data collection and to determine the information use pattern of the researchers. A data collection tool, designed to fulfill the specific objectives of the present study, consisted of 5”X4” slips. The information which was

necessary for the study was noted down manually on the slips from the citations of the doctoral theses. Collaborative authorship slips, slips of chronological distribution of cited books and journals as well as slips for form wise distribution of cited works were prepared separately.

### **Data analysis techniques**

The data collected from the citations in 36 Ph.D. theses was analysed by applying appropriate techniques and bibliometric laws. The simple counting citation technique and Bradford's law was applied to determine the core journals in the field of History. MS- Excel was used for the analysis of the data and also its graphical representations wherever required.

### **Data analysis and interpretation**

A total of 36 Ph.D. theses were submitted in the Department of History during 2002-2012, in which 8488 sources were cited by the researchers. The following section analyses the citations of such theses on the basis of various dimensions like year of submission, form of cited documents, authorship pattern, etc.

### **Year-wise submission of Ph.D. theses**

Table 1 shows the year wise submission of Ph.D. theses in the Department of History at Panjab University during 2002- 2012.

<b>Year of submission</b>	<b>No. of Ph.D. theses submitted</b>	<b>%</b>
2002	1	2.86
2003	2	5.71
2004	1	2.86
2005	1	2.86
2006	--	--
2007	8	22.86
2008	7	20
2009	3	8.57



2010	5	14.28
2011	3	8.57
2012	4	11.43
Total	35	100

**Table 1: Year-wise submission of Ph.D. theses submitted in the Department of History**

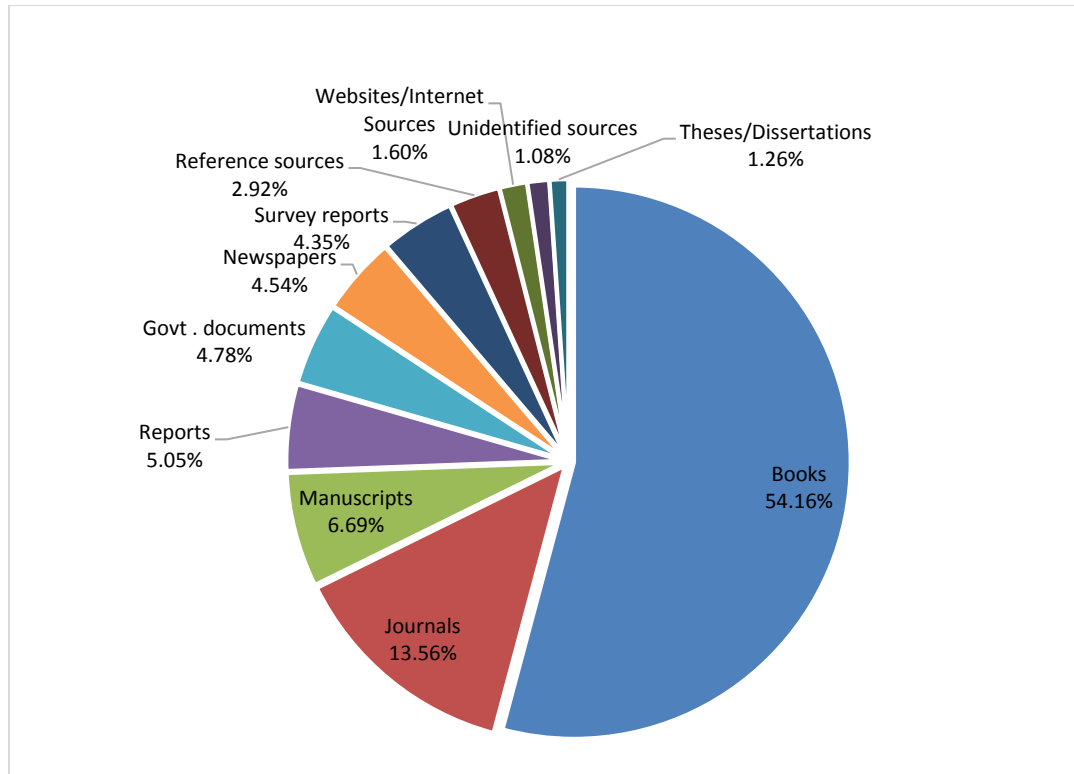
Table 1 shows the submission of the Ph.D. theses in Department of History during 2002-2012. The highest number of theses were submitted in 2007 (8, 22.86%), whereas the least number of theses (1, 2.86%) were submitted in 2002, 2004 and 2005. respectively. It also shows that no thesis was submitted in the Department of History during 2006.

### **Form of cited documents**

Table 2 and figure 1 below represent the number of citations pertaining to different types of publications like journals, books, reports, reference sources, Newspaper, theses/ dissertations, etc.

<b>Sr. no.</b>	<b>Form of cited documents</b>	<b>Count</b>	<b>Cumulative count</b>	<b>%</b>	<b>% of cumulative count</b>
1	Books	4597	4597	54.16	54.16
2	Journals	1151	5748	13.56	67.72
3	Manuscripts	568	6316	6.69	74.41
4	Reports	429	6745	5.05	79.47
5	Government documents	406	7151	4.78	84.25
6	Newspapers	385	7909	4.54	93.13
7	Survey reports	369	7520	4.35	88.60
8	References sources, Gazetteers , Dictionaries, Encyclopedias, Manuals	248	8153	2.92	96.05
9	Websites/Internet sources	136	8289	1.60	97.66
10	Theses/Dissertations	107	8396	1.26	98.92
11	Unidentified sources	92	8488	1.08	100.00

**Table 2: Form of cited documents in the Ph.D. theses in History**



**Figure 1: Form of cited documents in History**

Table 2 and figure 1 reveal that out of 8488 citations cited in the Ph.D. theses submitted in the Department of History, books comprised the highest citations (4597, 54.16%), followed by journal's citations (1151, 13.56%), Manuscripts (568, 6.69%), reports (429, 5.05%), government documents (406, 4.78%), newspapers (385, 4.54 %), survey reports (369, 4.35%), reference sources (248, 2.92%), websites/ Internet sources (136, 1.60%) and theses and dissertations (107, 1.26%). Citations to unidentified sources were the least (92, 1.08%). Since citations to journals and books together accounted for more than 67%, authorship pattern, half-life, etc. were calculated for such documents only.

### **Authorship pattern in citations**

Table 3 shows the authorship pattern of citations in the Ph.D. theses submitted in the Department of History.

Authorship Pattern	Books				Journals					
	Citations	Cumulative citations	%	Cumulative %	Citations	Cumulative citations	%	Cumulative %	Total citations	% of total citations
Single	4006	4006	87.14	87.14	778	778	67.59	67.59	4784	83.23
Two	503	4509	10.94	98.08	218	996	18.94	86.53	721	12.54
Three	72	4581	1.57	99.65	122	1118	10.60	97.13	194	3.38
More than three	16	4597	0.35	100	33	1151	2.87	100	49	0.85
Total	4597	--	100	--	1151	--	100	--	5748	100

**Table 3: Authorship pattern of citations in History**

A total of 5748 citations to books and journals were analysed to ascertain the authorship pattern in the Ph.D. theses submitted to the Department of History, Panjab University (Chandigarh) during the study period. Table 3 analysed the authorship pattern of the cited books and journals. Out of the total citations, books accounted for 4597 citations (54.16%), while journals accounted for 1151 citations (13.56%). It is clear from the above table that citations to single authorship was higher in books (4006, 87.14 %) as well as journals (778, 67.59%). Two authors accounted for 503 citations (10.94%) to books and 218 citations (18.94%) to journals, followed by three authors with 72 citations (1.57%) to books and 122 citations (10.60%) to journals. Citations to more than three authors were the least (0.35% in books and 33, 2.87% in journals).

In order to find out the research collaboration, a formula proposed by Subramanyam (1983) was applied to the data. The degree of collaboration of books was calculated as 0.13 (Appendix 1-a) and the degree of collaboration of authors in cited journal articles were calculated as 0.32 (Appendix 1-b). Collaborative index, which is the number of authors per paper, was calculated using the formula given by Lawani (1986). Collaborative Index for books

was calculated as 0.95 (Appendix 1-c) and Collaborative Index for journals was calculated as 1.51 (Appendix 1-d). Collaborative coefficient was calculated as per the formula given by Ajiferuke (1983). Collaborative Coefficient of authors of books was calculated as 0.06 (Appendix 1-e) and collaborative coefficient of authors of journal articles was calculated as 0.19 (Appendix 1-f).

### **Obsolescence of cited literature**

‘Half-life’ or ‘Obsolescence rate’ of the documents cited in the theses submitted in the Department of History were also calculated by analyzing the age of the cited documents to assess the decline in the use of documents over time. The obsolescence of journals and books to given below:

### **Obsolescence of cited journals**

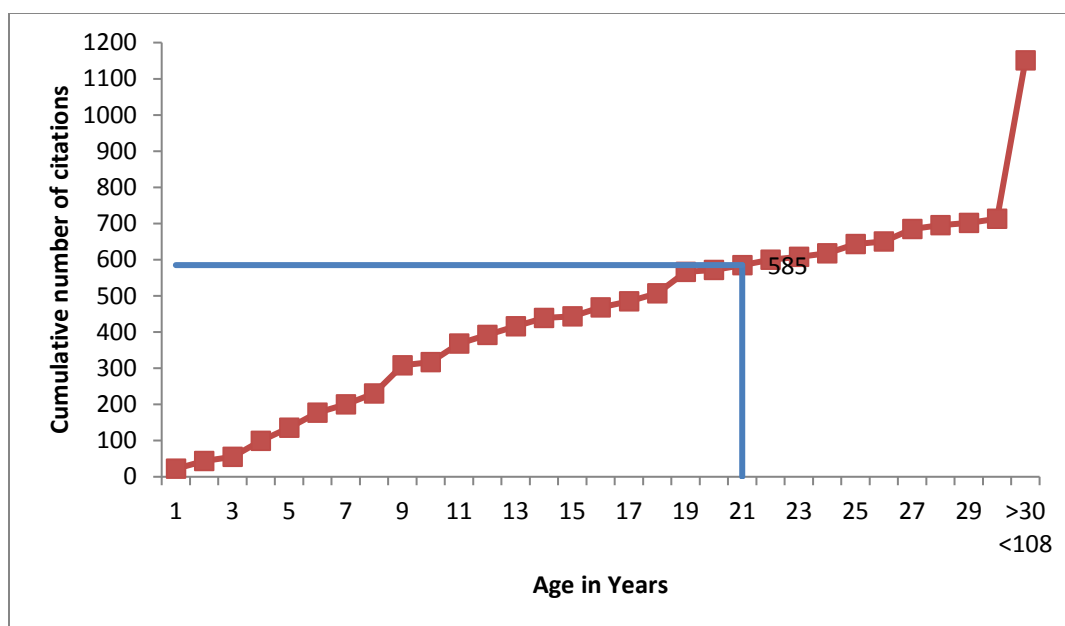
Table 4 shows the obsolescence of journals as cited in 36 Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh) during 2002-2012:

<b>Age in years</b>	<b>No. of Citations</b>	<b>Cumulative citations</b>	<b>%</b>	<b>% of cumulative citations</b>
1	22	22	1.91	1.91
2	22	44	1.91	3.82
3	11	55	0.96	4.78
4	44	99	3.82	8.60
5	37	136	3.21	11.82
6	41	177	3.56	15.38
7	23	200	2.00	17.38
8	30	230	2.61	19.98
9	78	308	6.78	26.76
10	9	317	0.78	27.54
11	51	368	4.43	31.97
12	24	392	2.09	34.06

13	24	416	2.09	36.14
14	23	439	2.00	38.14
15	4	443	0.35	38.49
16	25	468	2.17	40.66
17	17	485	1.48	42.14
18	22	507	1.91	44.05
19	59	566	5.13	49.17
20	6	572	0.52	49.70
21	13	585	1.13	50.83
22	15	600	1.30	52.13
23	8	608	0.70	52.82
24	10	618	0.87	53.69
25	25	643	2.17	55.86
26	7	650	0.61	56.47
27	35	685	3.04	59.51
28	10	695	0.87	60.38
29	7	702	0.61	60.99
30	11	713	0.96	61.95
>30 <108	438	1151	38.05	100.00

**Table 4: Half-life of journal articles cited in the Ph.D. theses submitted in the Department of History**

Table 4 presents the number of citations and their respective ages. It depicts that 136 journals citations (11.82%) are just 5 years old, 317 citations (27.54%) are 10 year old and 443 citations (38.49%) are 15 years old. The maximum age of the citations was found to be 108 years. This shows that the researchers in the Department of History cite journal articles published even 100 years back. The table also shows that the half-life of 50.83% journal citations are just 21 years. Figure 2 shows the half-life of journals for cumulative frequency of citations.



**Figure 2: Bar graph showing half-life of journals for cumulative frequency of citations in History**

Figure 2 above shows that the time taken to cite 1151 citations was 108 years. It can be seen that the x-coordinate for 585 cumulative citations (half of the total citations) is 21 years. Thus, 21 years was found to be the half-life of journals cited in the theses submitted in Department of History at Panjab University (Chandigarh).

### Obsolescence of cited books

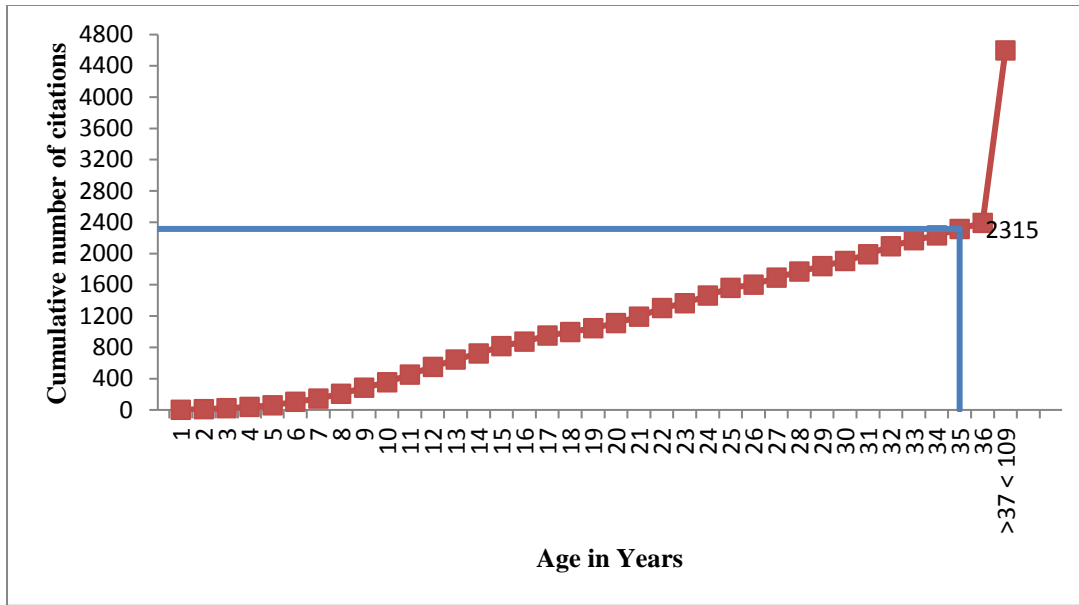
Table 5 shows the obsolescence of Books as cited in 36 Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh) during 2002-2012.

Age in years	No. of citations	Cumulative citations	%	% of cumulative citations
1	3	3	0.07	0.07
2	7	10	0.15	0.22
3	12	22	0.26	0.48
4	16	38	0.35	0.83
5	19	57	0.41	1.24
6	47	104	1.02	2.27
7	40	144	0.87	3.14
8	61	205	1.33	4.46
9	79	284	1.72	6.18

10	68	352	1.48	7.66
11	101	453	2.20	9.86
12	98	551	2.13	11.99
13	92	643	2.00	13.99
14	78	721	1.70	15.69
15	97	818	2.11	17.80
16	54	872	1.17	18.97
17	81	953	1.76	20.74
18	42	995	0.91	21.65
19	52	1047	1.13	22.78
20	63	1110	1.37	24.15
21	81	1191	1.76	25.91
22	112	1303	2.44	28.35
23	60	1363	1.31	29.65
24	100	1463	2.18	31.83
25	98	1561	2.13	33.96
26	42	1603	0.91	34.88
27	88	1691	1.91	36.79
28	77	1768	1.68	38.46
29	72	1840	1.57	40.03
30	65	1905	1.41	41.44
31	84	1989	1.83	43.27
32	102	2091	2.22	45.49
33	81	2172	1.76	47.25
34	61	2233	1.33	48.58
35	82	2315	1.78	50.36
36	77	2392	1.68	52.04
>37 < 109	2205	4597	47.97	100.00

**Table 5: Half-life of books cited in the Ph.D. theses submitted in the Department of History**

Table 5 represents the number of citations and their respective ages. It reveals that 57 book citations (1.24%) are just 5 year old, 352 citations (7.66%) are 10 year old and 818 citations (17.80%) are 15 years old. The maximum age of the citations were found to be 109 years. This shows that the researchers in the Department of History cite book published even 100 years back. The table also shows that half-life of 50.36% book citations are 35 years. Figure 4.8 shows the half-life of books for cumulative frequency of citations.



**Figure 3: Bar graph showing half-life of books for cumulative frequency of citations in History**

Figure 3 above shows that the time taken to cite 4597 citations was 109 years. It can be seen that the x-coordinate for 2315 cumulative citations (half of the total citations) is 35 years. Thus, 35 years was found to be the half-life of books cited in Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh) during 2002-2012.

### **Chronological distribution of citations**

Chronological distribution of citations in the Ph.D. theses in a particular field indicates whether the research carried out is up to date with the latest research taking place in that area or not. The citations analysed in the present study were distributed into groups of ten years each to know their chronological distribution.

### **Chronological distribution of citations to journals**

Table 6 and figure 4 show the decade-wise distribution of journals' citations used in the Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh).

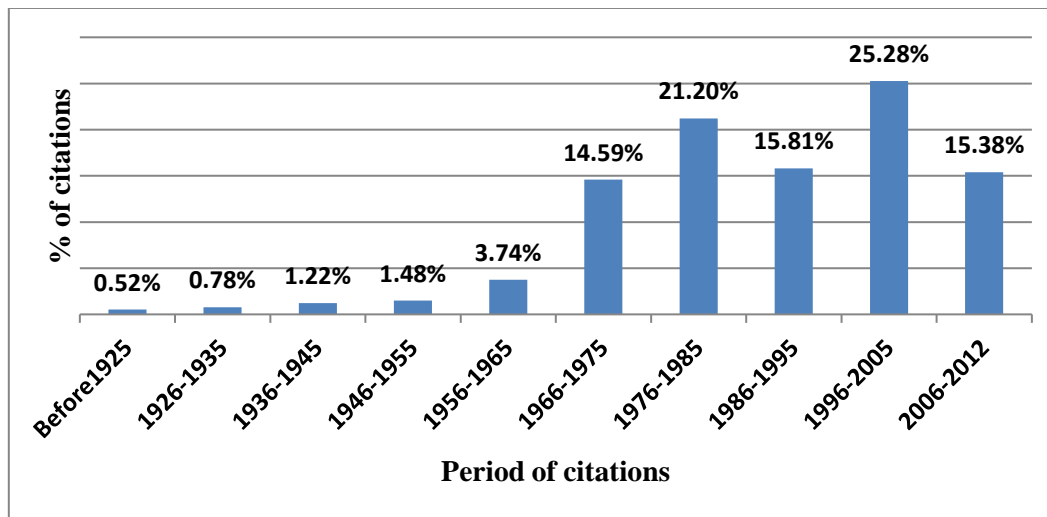
Sr. no.	Period	Frequency of occurrence	Cumulative Frequency	% of frequency	% of cumulative frequency
1	Before 1925	6	6	0.52	0.52
2	1926-1935	9	15	0.78	1.3
3	1936-1945	14	29	1.22	2.52
4	1946-1955	17	46	1.48	4



5	1956-1965	43	89	3.74	7.74
6	1966-1975	168	257	14.59	22.33
7	1976-1985	244	501	21.2	43.53
8	1986-1995	182	643	15.81	59.34
9	1996-2005	291	934	25.28	84.62
10	2006-2012	177	1151	15.38	<b>100</b>

**Table 6: Chronological distribution of citations to journals in History**

Table 6 above shows the chronological distribution of cited journals in the Ph.D. theses submitted in the Department of History, Panjab University (Chandigarh). The highest number of journal citations belong to publications published during 1996-2005 (291, 25.28%), followed by 244 citations (21.2%) to journals published during 1976-1985, 182 citations (15.81%) to journals published during 1986-1995, 177 citations (15.38%) to journals published during 2006-2012, 168 citations (14.59%) to journals published during 1966-1975, 43 citations (3.74%) to journals published during 1956-1965, 17 citations (1.48%) to journals published during 1946-1955, 14 citations (1.22%) to journals published during 1936-1945, 9 citations (0.78%) to journals published during 1926-1935 and 6 citations (0.78%) to journals published before 1925. It is clear from the table that minimum citations belonged to publications published prior to 1925.



**Figure 4: Chronological distribution of citations to journals in History**

Figure 4 gives a pictorial representation of the chronological distribution of the citations to journal articles cited in the Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh). It shows that the highest citations were gained by the journal articles published during 1996-2005. The figure also shows that there has been a steady growth in

citations till the time period of 1966-1975. After that, there has been a steep growth in the citations for the period 1986-1995 and 1996-2005. It can be also seen from the figure that there has been a steep decline in citations to journal articles from 1996-2005 to 2006-2012.

### **Chronological distribution of citations to books**

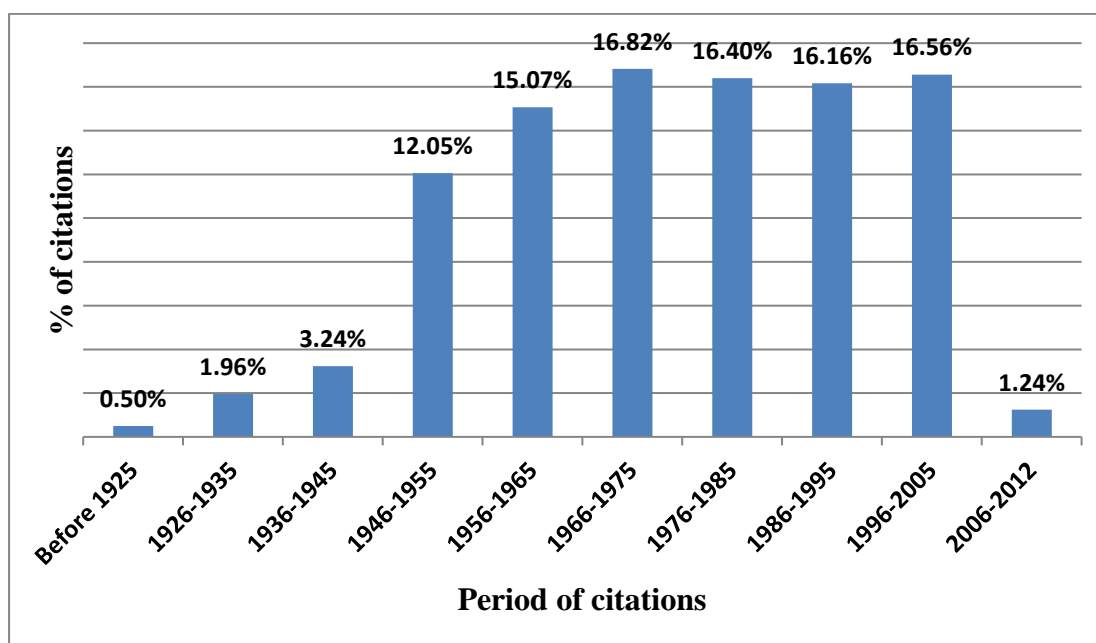
Table 7 and figure 5 show the decade-wise distribution of book citations used in the Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh).

<b>Sr. no.</b>	<b>Period</b>	<b>Frequency of occurrence</b>	<b>Cumulative Frequency</b>	<b>% of frequency</b>	<b>% of cumulative frequency</b>
1	Before 1925	23	23	0.5	0.5
2	1926-1935	90	113	1.96	2.46
3	1936-1945	149	262	3.24	5.7
4	1946-1955	554	816	12.05	17.75
5	1956-1965	693	1509	15.07	32.82
6	1966-1975	773	2282	16.82	49.64
7	1976-1985	754	3036	16.4	66.04
8	1986-1995	743	3779	16.16	82.2
9	1996-2005	761	4540	16.56	98.76
10	2006-2012	57	4597	1.24	<b>100</b>

**Table 7 Chronological distribution of citations to books in History**

Table 7 shows the decade wise distribution of book citations. It reveals that highest number of citations (773, 16.82%) were from the books published during the period of 1966-1975, followed by 761 citations (16.56%) to books that were published during 1996-2005, 754 citations (16.40%) to books published during 1976-1985, 743 citations (16.16%) to books published during 1986-1995, 693 citations (15.07%) to books published during 1956-1965, 554 citations (12.05%) to books published during 1946-1955, 149 citations (3.24%) to books published during 1936-1945, 90 citations (1.96%) to books published during 1926-1935, 57

citations (1.24%) to books published during 2006-2012, and 23 citations (0.5%) to books published before 1925.



**Figure 5: Chronological distribution of citations to books in History**

Figure 5 above reveals the pictorial representation of the chronological distribution of the citations to books cited in the Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh). It shows that there has been a steady growth in citations for the time period of 1936-1945. It can be also seen from the figure that there has been a steep decline in citations to books from 1996-2005 to 2006-2012.

### **Geographical distribution of citations**

Table 8 shows the geographical distribution of books and journals' citations used in the Ph.D. theses submitted in the Department of History at Panjab University (Chandigarh).

O u n i t	Books	Journals
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	Citations	Cumulative citations	%	Cumulative %	Citations	Cumulative citations	%	Cumulative %
India	2698	2698	58.69	58.69	742	742	64.47	64.47
UK	1017	3715	22.12	80.81	147	889	12.77	77.24
USA	673	4388	14.64	95.45	171	1060	14.86	92.10
Pakistan	209	4597	4.55	100.00	10	1070	0.87	92.97
China	--		--	--	29	1099	2.52	95.49
Afghanistan	--		--	--	52	1151	4.52	100.0

**Table 8: Geographical distribution of citations in History**

Table 8 reveals that majority of citations of books (2698, 58.69%) and journals (742, 64.47%) are Indian publications, followed by publications from UK (1017, 22.12% for books and 147, 12.77% for journals) and USA (673, 14.64% for books and 171, 14.86% for journals). It is clear from the table that there are no citations of books published from China and Afghanistan, although journal citations from such countries were seen.

### **Ranking of cited journals**

To determine the core journals in the field of History, a rank frequency distribution of all cited journal articles was undertaken. The title of the cited journal was recorded against each cited journal article in the work sheet. The distribution was ranked in order of journals that are most frequently cited. Ranking of the cited journals was prepared on the basis of the total citation frequency received by each journal. The titles have been arranged in a decreasing order of the number of citations. It is given in table 9 along with their ranks and percentage of citations.

<b>Sr. no.</b>	<b>Title</b>	<b>Citations</b>	<b>Cumulative Citations</b>	<b>%</b>	<b>Cumulative %</b>	<b>Rank</b>
1	Economic & Political Weekly	82	82	7.12	7.12	1
2	The Punjab Past and Present	80	162	6.95	14.07	2
3	The Indian Historical Review	64	226	5.56	19.64	3
4	Indian Economic & Social History Review	48	274	4.17	23.81	4
5	Modern Asian Studies	40	314	3.48	27.28	5
6	Journal of Asian Studies	36	350	3.13	30.41	6
7	Punjab Journal of Politics	36	386	3.13	33.54	6
8	Social Scientist	35	421	3.04	36.58	7
9	Indian Journal of Political Science	28	449	2.43	39.01	8
10	Indian Historical Quarterly	24	473	2.09	41.09	9
11	Indian Culture	24	497	2.09	43.18	9
12	Indian Journal of Social Work	24	521	2.09	45.26	9
13	Contributions to Indian Sociology	24	545	2.09	47.35	9
14	Indian Economic & History Review	22	567	1.91	49.26	10
15	Asiatick Researches	22	589	1.91	51.17	10
16	Journal of Economic and Social History of the Orient	19	608	1.65	52.82	11
17	The Washington Quarterly	17	625	1.48	54.30	12
18	Journal of Peasant Studies	14	639	1.22	55.52	13
19	Journal: Islam and the Modern Age	14	653	1.22	56.73	13
20	India International Centre Quarterly	14	667	1.22	57.95	13
21	Asian Survey	12	679	1.04	58.99	14
22	Journal of Commonwealth Political Studies	10	689	0.87	59.86	15
23	Indian Journal of Agricultural Economics	10	699	0.87	60.73	15
24	The India Journal of Social Work	10	709	0.87	61.60	15
25	Journal of Bihar and Orissa Research Society	10	719	0.87	62.47	15
26	American Political Science Review	9	728	0.78	63.25	16
27	Social Change	9	737	0.78	64.03	16
28	Social Science Research Journal	8	745	0.70	64.73	17
29	Journal of Indian History	8	753	0.70	65.42	17

30	Medieval Indian Quarterly	8	761	0.70	66.12	17
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**Table 9 Ranked list of highly cited journals in History**

Table 9 shows that out of a total of 181 journals cited in the theses submitted during the study period, 'Economic & Political Weekly' was highly cited journal (82, 7.12%), followed by 'The Punjab Past and Present' (80, 6.95%), 'The Indian Historical Review' (64, 5.56%), 'Indian Economic & Social History Review' (48, 4.17%), 'Modern Asian Studies' (40, 3.48%), 'Journal of Asian Studies' (36, 3.13%), 'Punjab Journal of Politics' (36, 3.13%), 'Social Scientist' (35, 3.04%), 'Indian Journal of Political Science' (28, 2.43%), 'Indian Historical Quarterly' (24, 2.09%), 'Indian Culture' (24, 2.09%), 'Indian Journal of Social Work' (24, 2.09%), 'Contributions to Indian Sociology' (24, 2.09%), and 'Indian Economic & History Review' (22, 1.91%). It also indicates that journals mentioned above covers 66.12% of the total citations and remaining 151 journals accounted for rest of the citations (33.88%).

#### **Application of Bradford's law to cited journals**

Table 10 below indicates the zones of the Bradford's law of scattering as applied to the citations in the theses submitted in the Department of History considered in the present study:

<b>Number of Zone</b>	<b>Number of Journal</b>	<b>Number of Journal Citations</b>	<b>Bradford's constant (k)</b>
Core zone	5	314	--
Zone 1	28	471	5.265
Zone 2	148	366	5.266
Total	181	1151	

**Table 10: Dispersion of journals in History**

Table 10 shows the distribution of journals into three zones. It is evident from the ratio (5:28:148) that the number of journals in the three zones is in geometric progression. Hence, it can be concluded that the dispersion of journals in the field of History satisfy the Bradford's law of scattering. The mathematical formulation was also applied to check the validity of the verbal formulation using the formula of Egghe (1986, 1990) where k was calculated as:

$$k = (1.781 * 82)^{1/3}$$

$$k = 5.266$$

Using the value of k calculated above, Bradford groups (zones) were also calculated. The

nucleus zone  $r_0$  is defined as:  $r_0 = \frac{181(5.266-1)}{(5.266^3-1)}$

$$r_0 = \frac{772.146}{145.03}$$

$$= 5.324$$

With  $r_0$  and k, different Bradford zones were calculated as below:

Nucleus zone  $r_0 = r_0 * 1 =$

$$5.324 * 1 = 5.324$$

First zone

$$r_1 = r_0 * k = 5.324 * 5.266 = 28.036$$

Second zone

$$r_2 = r_0 * k^2 = 5.324 * 5.266^2 = 147.638$$

This theoretical distribution of Bradford's law enabled the testing of the exact fit of Bradford's law to the data in the present study. Using this distribution, the number of citations from each Bradford's group were calculated as shown in table 10. The exact number of each Bradford's group were calculated using the value of k and  $r_0$ ,  $r_1$  and  $r_2$ . By dividing  $r_2$  by  $r_1$  and  $r_1$  by  $r_0$ , the value of 5.265 and 5.266 respectively were calculated which is equivalent to the value of k as calculated using the formula of Egghe (1986, 1990). This shows that in the present study, the journals cited in the theses submitted in the Department of History are in accordance with Bradford's distribution.

### Findings of the study

To study the citation analysis of Ph.D. theses in the field of History, 8488 citations from 36 Ph.D. theses submitted in the Department of History during 2002-2012 were analysed. The major findings of their analysis show:

- I. The highest number of theses in History were submitted in 2007 (22.86%).

- II. The researchers in the discipline of History use books and journals more than other form of documents for their research work. Book citations accounted for 54.16% and journal citations accounted for 13.56% citations.
- III. Citations to single authorship were dominant than joint authorship in both books (87.14%) and journals (67.59%).
- IV. The degree of collaboration of books was calculated as 0.13 and degree of collaboration of journals was calculated as 0.32.
- V. Collaborative index of books was calculated as 0.95 and collaborated index of journals was calculated as 1.51
- VI. Collaborative coefficient for books was calculated as 0.06 and collaborated coefficient for journals was calculated as 0.19.
- VII. The half life period of journals citations was found to be 21 years and the half life period of book citations was found to be 35 years.
- VIII. Maximum number of citations to journals (25.28%) belong to publications published during 1996-2005 and books (16.82%) belong to publications published during 1966-1975.
- IX. Majority of citation to books (58.69%) and journals (64.47%) were of Indian origin, followed by U.K. and U.S.A.
- X. Out of 181 journals cited in the Ph.D. theses, Economic & Political Weekly was found to be the most cited journal.
- XI. The dispersion of journals in the field of History satisfy the formulation of Bradford's law of scattering.

### **Conclusion**

Citation analysis is generally regarded as a valuable tool for determining the impact of a scholarly work. Majority of the citations were to publications authored by single authored, followed by two authors, three authors and more than three authors in the theses submitted in the discipline of History. The results indicate that the highest average of citations were to single authors, whereas more than three authors received the least average citations. Degree of authors'



collaboration has been found more in journals in the field of History. Citations to books were observed more in the field of History. The result enlightens the fact that the researchers in History tend to cite older research works more as historical research is dependent on secondary sources largely. The geographical distribution of the cited books indicates more of the national publications in the field of History. This may be due to the fact that in the discipline of History, research is more focused on local and national issues. Hence, the researchers tend to use more national publications dealing with local and national issues. This provides valuable information to the librarians for forming sustainable collection development policy. The Bradford's law of scattering was found to be fit as far as the dispersion of journals in the discipline of History. This indicates that the journals used by the researchers are also the core journals of their respective disciplines. This shall further be useful information for the university librarian in devising the list of core journals and help in collection management of journals.

### **Suggestions**

The following suggestions are recommended:

- I. While citing the work of others, the researchers should cite the complete bibliographical information in a standard reference style so as to avoid the inaccurate and incomplete citation.
- II. University library should organize orientation programmes for the research scholars so as to make them aware about the available resources in the library and also to sensitize them as to how to cite the information sources.
- III. University librarians should evaluate the library's acquisition as well as well as weeding out policy on the basis of the researchers' information needs as cited in their research work.

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## Appendix 1

### 1 (a) Degree of Collaboration of authorship (Books)

Here,  $N_m = 591$

$N_s = 4006$

$$C = \frac{591}{591 + 4006} = \mathbf{0.13}$$

Degree of Collaboration of Books was calculated = 0.13

### 1 (b) Degree of Collaboration of authorship (journals)

Here, Nm= 373

Ns= 778

$$C = \frac{373}{373 + 778} = \mathbf{0.32}$$

### 1 (c) Collaborative Index for Books

$$CI = \frac{(4006 + 2 \times 503 + 3 \times 72 + 5 \times 16)}{4597}$$

$$\mathbf{CI=0.95}$$

### 1 (d) Collaborative Index for Journals

$$CI = \frac{(F_1 + 2F_2 + 3F_3 + 4F_4 + \dots + kF_k)}{N}$$

$$CI = \frac{(778 + 2 \times 436 + 3 \times 366 + 5 \times 165)}{1151}$$

$$\mathbf{CI=1.51}$$

### 1 (e) Collaborative Coefficient (Books)

$$\text{Here, } CC = 1 - \frac{\left(4006 + \frac{1}{2}503 + \frac{1}{3}72 + \frac{1}{5}16\right)}{4597}$$

$$1 - \frac{128541}{30} * \frac{1}{4597}$$

$$CC = 1 - \frac{128541}{137910}$$

$$\mathbf{CC=0.06}$$

#### **1 (f) Collaborative Coefficient of (Journals)**

$$\text{Here, } CC = 1 - \frac{\left(778 + \frac{1}{2}218 + \frac{1}{3}122 + \frac{1}{5}33\right)}{1151}$$

$$1 - \frac{14014}{15} * \frac{1}{1151}$$

$$CC = 1 - \frac{14014}{17265}$$

$$\mathbf{CC=0.19}$$